CLAIMS

1. A wireless communication system, comprising:

a multi-beam directed signal system configured for directed wireless communication with a client device; and

an antenna assembly configured to receive the directed wireless communication and emanate a directed communication beam for data communication with the client device.

2. A wireless communication system as recited in claim 1, wherein the multi-beam directed signal system is further configured to generate a second directed wireless communication to a second client device, and wherein the antenna assembly is further configured to receive the second wireless communication and emanate a second directed communication beam for additional data communication with the second client device.

3. A wireless communication system as recited in claim 1, wherein:

the multi-beam directed signal system is further configured to generate a second directed wireless communication to a second client device;

the antenna assembly is further configured to receive the second wireless communication and emanate a second directed communication beam for additional data communication with the second client device; and

the antenna assembly is further configured to emanate the directed communication beam such that only the client device will receive the data communication, and further emanate the second directed communication beam such that only the second client device will receive the additional data communication.

4. A wireless communication system as recited in claim 1, wherein:

the multi-beam directed signal system is multi-channel and further configured for directed wireless communication with a second client device;

the antenna assembly is further configured to emanate the directed communication beam for data communication with the client device via a first channel; and

the antenna assembly is further configured to emanate a second directed communication beam for additional data communication with the second client device via a second channel.

5. A wireless communication system as recited in claim 1, wherein:

the multi-beam directed signal system is multi-channel and further configured for directed wireless communication with a second client device;

the antenna assembly includes a phased array of antenna elements each configured to emanate a communication beam;

the antenna assembly is further configured to emanate the directed communication beam from a first antenna element for the data communication with the client device via a first channel; and

the antenna assembly is further configured to emanate a second directed communication beam from a second antenna element for additional data communication with the second client device via a second channel.

6. A wireless communication system as recited in claim 1, wherein:

the multi-beam directed signal system is multi-channel and further configured for simultaneous directed wireless communication with a second client device;

the antenna assembly is further configured to emanate the directed communication beam for data communication transmission to the client device via a first channel; and

the antenna assembly is further configured to emanate a second directed communication beam for data communication reception from the second client device via a second channel.

7. A wireless communication system as recited in claim 1, wherein the multi-beam directed signal system is further configured for simultaneous directed wireless transmission to the client device and directed wireless reception from a second client device.

8. A wireless communication system as recited in claim 1, wherein the antenna assembly is further configured to emanate the directed communication beam as an electromagnetic signal that includes transmission peaks and transmissions nulls within a coverage area of the communication beam.

9. A wireless communication system as recited in claim 1, wherein:

the antenna assembly is further configured to emanate the directed communication beam as an electromagnetic signal that includes a signal transmission peak within a first coverage area and a signal transmission null within a second coverage area; and

the antenna assembly is further configured to emanate a second directed communication beam as a second electromagnetic signal that includes a second signal transmission peak within the second coverage area and a second signal transmission null within the first coverage area.

10. A wireless communication system as recited in claim 1, wherein the antenna assembly is further configured to emanate a second directed communication beam for the data communication with the client device when the directed communication beam is determined ineffective for data communication.

11. A wireless communication system as recited in claim 1, wherein:

the multi-beam directed signal system is further configured to determine when the directed communication beam is ineffective for data communication with the client device, and is further configured to generate the directed wireless communication for the data communication via a second directed communication beam; and

the antenna assembly is further configured to emanate the second directed communication beam for the data communication with the client device.

12. A wireless communication system as recited in claim 1, wherein the antenna assembly is further configured to emanate multiple directed communication beams, and wherein the multi-beam directed signal system includes signal coordination logic that monitors the multiple directed communication beams each as an individual access point.

13. A wireless communication system as recited in claim 1, wherein the multi-beam directed signal system includes signal coordination logic that controls a directed wireless transmission to the client device and directed wireless reception from a second client device such that the directed wireless transmission does not interfere with the directed wireless reception.

14. A Wi-Fi switch comprising the wireless communication system as recited in claim 1.

15. A Wi-Fi switch for 802.11 specification data packet communication comprising the wireless communication system as recited in claim 1.

16. A method, comprising:

generating a directed wireless communication for data communication with a client device;

receiving the directed wireless communication at an antenna assembly; and

emanating a directed communication beam for the data communication with the client device.

17. A method as recited in claim 16, further comprising:

generating a second directed wireless communication for additional data communication with a second client device;

receiving the second directed wireless communication at the antenna assembly; and

emanating a second directed communication beam for the additional data communication with the second client device.

18. A method as recited in claim 16, further comprising:

generating a second directed wireless communication for additional data communication with a second client device;

receiving the second directed wireless communication at the antenna assembly;

emanating a second directed communication beam for the additional data communication with the second client device; and

wherein the directed communication beam is emanated such that only the client device will receive the data communication, and the second directed communication beam is emanated such that only the second client device will receive the additional data communication.

19. A method as recited in claim 16,

generating a second directed wireless communication for additional data communication with a second client device;

receiving the second directed wireless communication at the antenna assembly;

emanating a second directed communication beam for the additional data communication with the second client device; and

wherein the directed communication beam is emanated from a first antenna element of the antenna assembly, and the second directed communication beam is emanated from a second antenna element of the antenna assembly.

20. A method as recited in claim 16, further comprising emanating a second directed communication beam for data communication reception from a second client device, and wherein emanating the directed communication beam includes emanating the directed communication beam for data communication transmission to the client device.

21. A method as recited in claim 16, further comprising:

transmitting the data communication to the client device via the directed communication beam;

receiving a second data communication from a second client device via a second directed communication beam; and

wherein transmitting the data communication and receiving the second directed data communication is simultaneous.

22. A method as recited in claim 16, wherein emanating the directed communication beam includes emanating an electromagnetic signal that includes transmission peaks and transmissions nulls within a coverage area of the directed communication beam.

23. A method as recited in claim 16, further comprising;

determining that the directed communication beam is ineffective for the data communication with the client device; and

emanating a second directed communication beam for the data communication with the client device.

24. A method as recited in claim 16, further comprising:

transmitting the data communication to the client device via the directed communication beam;

receiving a second data communication from a second client device via a second directed communication beam; and

controlling transmitting the data communication such that the data communication does not interfere with receiving the second data communication.

25. A multi-beam directed signal system, comprising:

signal coordination logic configured to coordinate directed wireless communication with client devices;

a transmit beam-forming network configured to route data communication transmissions to one or more of the client devices via directed communication beams that are emanated from an antenna assembly; and

a receive beam-forming network configured to receive data communication receptions from one or more of the client devices via the directed communication beams.

26. A multi-beam directed signal system as recited in claim 25, further comprising:

receiver/transmitters each configured to transmit a data communication transmission to one or more of the client devices, and each further configured to receive a data communication reception from one or more of the client devices;

wherein the transmit beam-forming network includes transmit ports that each couple an individual antenna element of the antenna assembly to a receiver/transmitter; and

wherein the receive beam-forming network includes receive ports that each couple an individual antenna element of the antenna assembly to a receiver/transmitter.

27. A multi-beam directed signal system as recited in claim 25, further comprising:

multiple channels each corresponding to a receiver/transmitter configured to transmit a data communication transmission to a client device and receive a data communication reception from the client device; and

a scanning receiver configured to receive a data communication reception from a client device and determine which of the multiple channels provides acceptable data communication transmission and reception with the client device.

28. A multi-beam directed signal system as recited in claim 25, further comprising a scanning receiver configured to scan the directed communication beams and monitor for the data communication receptions from one or more of the client devices.

29. A multi-beam directed signal system as recited in claim 25, further comprising:

a memory component configured to maintain information corresponding to one or more of the client devices, the information including at least one of a transmit power level, a data transmit rate, an antenna direction, quality of service data, and timing data; and

wherein the signal coordination logic is further configured to coordinate the directed wireless communication with one or more of the client devices based on the information maintained with the memory component.

30. A multi-beam directed signal system as recited in claim 25, further comprising medium access controllers each corresponding to a directed communication beam and configured to communicate data packets for the directed wireless communication between the multi-beam directed signal system and a communication network.

31. A multi-beam directed signal system as recited in claim 25, wherein the transmit beam-forming network is further configured to transmit energy on a side lobe of a directed communication beam corresponding to a first client device such that a second client device will detect the side lobe energy and recognize that a data communication transmission is being emanated to the first client device via the directed communication beam.

32. A multi-beam directed signal system as recited in claim 25, wherein the signal coordination logic is further configured to coordinate that only a first client device will receive a first directed wireless communication via a first communication beam, and that only a second client device will receive a second directed wireless communication via a second communication beam.

33. A multi-beam directed signal system as recited in claim 25, wherein the signal coordination logic is further configured to coordinate a simultaneous data communication transmission to a first client device via a first directed communication beam and a data communication reception from a second client device via a second directed communication beam.

34. A multi-beam directed signal system as recited in claim 25, wherein:

the signal coordination logic is further configured to determine when a directed communication beam is ineffective for a data communication transmission to a client device; and

the transmit beam-forming network is further configured to route the data communication transmission to the client device via a second directed communication beam.

35. A multi-beam directed signal system as recited in claim 25, wherein the signal coordination logic is further configured to monitor the directed communication beams each as an individual access point.

36. A multi-beam directed signal system as recited in claim 25, wherein the signal coordination logic is further configured to coordinate a data communication transmission to a first client device and a data communication reception from a second client device such that the data communication transmission does not interfere with the data communication reception.

37. A Wi-Fi switch comprising the multi-beam directed signal system as recited in claim 25.

38. A Wi-Fi switch for 802.11 specification data packet communication comprising the multi-beam directed signal system as recited in claim 25.

39. A method, comprising:

coordinating directed wireless communication with client devices via directed communication beams emanated from an antenna assembly;

routing data communication transmissions through a transmit beam-forming network to antenna elements of the antenna assembly such that a data communication transmission is communicated to a client device via a directed communication beam; and

receiving data communication receptions through a receive beam-forming network from the antenna elements of the antenna assembly such that a data communication reception is received from a client device via a directed communication beam.

40. A method as recited in claim 39, further comprising:

receiving a data communication reception from a client device with a scanning receiver; and

determining which of multiple channels provides acceptable data communication transmission and reception with the client device.

41. A method as recited in claim 39, further comprising monitoring the directed communication beams for the data communication receptions from one or more of the client devices.

42. A method as recited in claim 39, further comprising:

maintaining information corresponding to one or more of the client devices, the information including at least one of a transmit power level, a data transmit rate, an antenna direction, quality of service data, and timing data; and

wherein coordinating the directed wireless communication includes coordinating a directed wireless communication with a client device based on the information that is maintained.

43. A method as recited in claim 39, further comprising generating a directed communication beam as an electromagnetic signal that includes transmission peaks and transmission nulls within a coverage area of the directed communication beam.

44. A method as recited in claim 39, further comprising transmitting energy on a side lobe of a directed communication beam corresponding to a first client device such that a second client device will detect the side lobe energy and recognize that a data communication transmission is being emanated to the first client device via the directed communication beam.

45. A method as recited in claim 39, further comprising:

determining when a directed communication beam is ineffective for a data communication transmission to a client device; and

routing the data communication transmission to the client device via a second directed communication beam.

46. A method as recited in claim 39, wherein coordinating directed wireless communication includes coordinating that only a first client device will receive a first directed wireless communication via a first communication beam, and that only a second client device will receive a second directed wireless communication via a second communication beam.

47. A method as recited in claim 39, wherein coordinating directed wireless communication includes coordinating a simultaneous data communication transmission to a first client device via a first directed communication beam and a data communication reception from a second client device via a second directed communication beam.

48. A method as recited in claim 39, wherein coordinating directed wireless communication includes coordinating a data communication transmission to a first client device and a data communication reception from a second client device such that the data communication transmission does not interfere with the data communication reception.

49. One or more computer-readable media comprising computer executable instructions that, when executed, direct a wireless communication system to:

coordinate directed wireless communication with client devices via directed communication beams emanated from an antenna assembly;

route data communication transmissions through a transmit beam-forming network to antenna elements of the antenna assembly such that a data communication transmission is communicated to a client device via a directed communication beam; and

receive data communication receptions through a receive beam-forming network from the antenna elements of the antenna assembly such that a data communication reception is received from a client device via a directed communication beam.

50. One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to:

receive a data communication reception from a client device with a scanning receiver; and

determine which of multiple channels provides acceptable data communication transmission and reception with the client device.

51. One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to monitor the directed communication beams for the data communication receptions from one or more of the client devices.

52. One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to:

maintain information corresponding to one or more of the client devices, the information including at least one of a transmit power level, a data transmit rate, an antenna direction, quality of service data, and timing data; and

coordinate a directed wireless communication with a client device based on the information that is maintained.

53. One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to generate a directed communication beam as an electromagnetic signal that includes transmission peaks and transmission nulls within a coverage area of the directed communication beam.

54. One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to:

generate a directed communication beam as an electromagnetic signal that includes a signal transmission peak within a first coverage area and a signal transmission null within a second coverage area; and

generate a second directed communication beam as a second electromagnetic signal that includes a second signal transmission peak within the second coverage area and a second signal transmission null within the first coverage area.

55. One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to transmit energy on a side lobe of a directed communication beam corresponding to a first client device such that a second client device will detect the side lobe energy and recognize that a data communication transmission is being emanated to the first client device via the directed communication beam.

56. One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to:

determine when a directed communication beam is ineffective for a data communication transmission to a client device; and

route the data communication transmission to the client device via a second directed communication beam.

57. One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to coordinate that only a first client device receives a first directed wireless communication via a first communication beam, and that only a second client device receives a second directed wireless communication via a second communication beam.

58. One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to coordinate a simultaneous data communication transmission to a first client device via a first directed communication beam and a data communication reception from a second client device via a second directed communication beam.

59. One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to coordinate a data communication transmission to a first client device and a data communication reception from a second client device such that the data communication transmission does not interfere with the data communication reception.

60. A method, comprising:

associating a client device with a directed communication beam;

receiving signal strength indications for data packets received from the client device;

calculating a signal strength average for the client device from the received signal strength indications; and

maintaining the client device association with the directed communication beam in an event that the signal strength average indicates that the directed communication beam provides an effective communication link.

61. A method as recited in claim 60, further comprising:

sampling adjacent signal strength indications of an adjacent directed communication beam;

calculating a second signal strength average for the adjacent directed communication beam;

comparing the signal strength average and the second signal strength average;

maintaining the client device association with the directed communication beam in an event that the signal strength average indicates that the directed communication beam provides a better communication link than the adjacent directed communication beam.

62. A method as recited in claim 60, further comprising:

sampling adjacent signal strength indications of an adjacent directed communication beam;

calculating a second signal strength average for the adjacent directed communication beam;

comparing the signal strength average and the second signal strength average;

disassociating the client device from the directed communication beam in an event that the second signal strength average indicates that the adjacent directed communication beam provides a better communication link than the directed communication beam; and

reassociating the client device with the adjacent directed communication beam.

63. A method as recited in claim 60, further comprising:

sampling adjacent signal strength indications of an adjacent directed communication beam;

calculating a second signal strength average for the adjacent directed communication beam;

comparing the signal strength average and the second signal strength average;

disassociating the client device from the directed communication beam in an event that the signal strength average indicates that the directed communication beam is an ineffective communication link; and

reassociating the client device with the adjacent directed communication beam in an event that the second signal strength average indicates that the adjacent directed communication beam provides an effective communication link.